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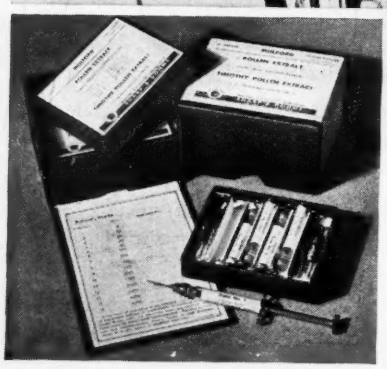

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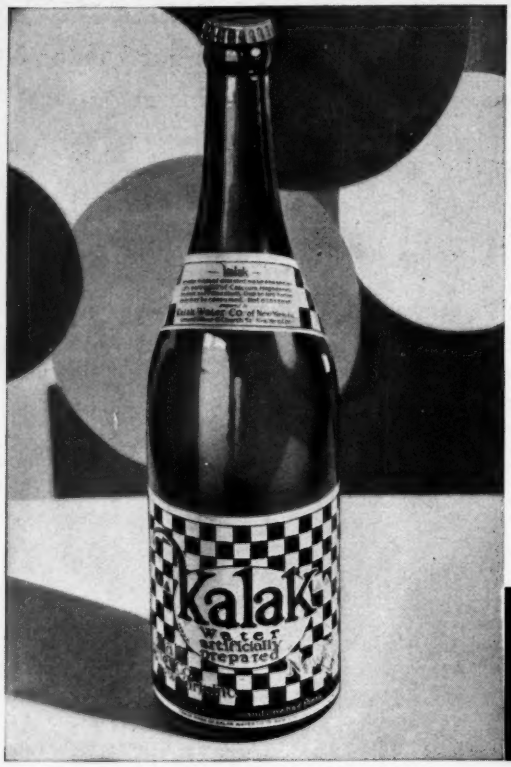

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ORIGINAL ARTICLES

THORACOPLASTY IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

By ESKE H. WINDSBERG, M.D.
223 THAYER STREET, PROVIDENCE, R. I.

The operation known as thoracoplasty is one that is designed to reduce the size of one side of the chest capacity by means of multiple rib resections. Thereby the contained lung is collapsed and compressed. Although employed for the most part in the treatment of certain forms of tuberculosis, thoracoplasty is indicated also in other types of intrathoracic and pulmonary disease, notably in bronchiectasis, in non-specific pulmonary abscess, and in chronic empyema. It may also be indicated supplementary to the removal of large intrathoracic tumors and after lobectomy.

Here we are concerned especially with the application of thoracoplasty to the collapse treatment of chronic pulmonary tuberculosis. Of operative procedures, Thoracoplasty is one of several that may be employed where surgical interference is indicated. Thus we have apicolysis or extraplural pneumolysis as devised by Tuffier, intrapleural pneumolysis as developed by Jacobaeses and Unverricht, paralysis of the diaphragm by means of phrenic nerve exaeresis, and intercostal neurectomy. All of these procedures have their specific indications and often are employed in conjunction with one another as well as with thoracoplasty.

Collapse therapy in the treatment of pulmonary tuberculosis is today a well established principle, and is an elaboration of the rest cure. Now, as is well known, the importance of rest in the treatment of tuberculosis has only in recent years become to be fully appreciated and widely accepted. In the middle of the last century, Rokitansky taught that in the consumptive the heart was too small and that it must be strengthened by carefully regulated exercise. His teachings were followed by Herman Brehmer, who was a pioneer in the sanatorium treatment. In practice, Brehmer, believing that the heart was weak, inaugurated regular though short rest periods. Thus he was the first to employ rest systematically though incidentally. In 1887 he was able to report many cures, something no other plan of therapy previously employed could claim.

As late as 1902 Brehmer's pupil Dettweiler firmly believed in the theory that fresh air cured tuberculosis, and thought exercise to be injurious. He therefore instituted long periods of rest in the open air. With him, too, rest was only incidental to the treatment. According to Pratt, it remained for Trudeau to become the first advocate of rest as the prime factor in a successful therapeutic plan. In 1916 Webb introduced postural rest for unilateral cases. For many hours each day the patient lies on the affected side, thereby curtailing its respiratory activity and allowing a more complete degree of functional and physiological rest.

The development of artificial pneumothorax by Forlanini in 1894 and Murphy in 1898, and the cures obtained by its use as evidenced by clinical and roentgenological data, demonstrated conclusively the effectiveness of complete rest. Pneumothorax, when successfully carried out, accomplishes complete selective rest, functionally and physiologically to a degree not possible of attainment by any other means. Due to pleural adhesions, pneumothorax cannot be effected in about 20% of individuals in whom collapse therapy is indicated. When the adhesions are string-like and few, they may be cut across by means of a cautery inserted into the pleural cavity under the guidance of a thoracoscope—that is, by means of intrapleural pneumolysis. The number of cases suitable for this procedure are few. Usually the adhesions are extensive and broad. In a limited number of instances extrapleural pneumolysis and paraffin filling will be the procedure of choice. Generally, when pneumothorax fails, thoracoplasty is the only suitable operation available. It offers a degree of collapse with reduction of lung volume which more closely approaches that of successful pneumothorax than is produced by means of any other extrapleural procedure.

*Read before the Providence Medical Association, May 2, 1932.

Thus thoracoplasty carries out by surgical means the idea of rest which has been the guiding principle and the only firmly established principle in the treatment of tuberculosis whether of the lungs or of other parts of the body. Furthermore, as has been indicated, thoracoplasty was developed to meet a specific situation in the treatment of pulmonary tuberculosis.

Pulmonary tuberculosis was not subjected to surgery until recent years chiefly because tuberculous patients are very poor surgical risks. Further, it is only in recent years that the many pitfalls surrounding thoracic surgery have been circumvented. These bars to surgical interference have been overcome in the past three decades; and especially in the past ten years, the surgery of pulmonary tuberculosis has been placed on a relatively safe plane. However, to effect a low mortality, a respect for the dangers entailed in thoracic surgery is essential; team work in the operating room highly desirable; and close co-operation between phthysiologist, roentgenologist, anesthetist, and surgeon indispensable.

Sir James Carson more than 100 years ago outlined the rationale upon which modern pulmonary compression therapy has been developed. He pointed out that the elasticity, condition of extension, and constant movement of the lungs prevent healing from taking place. Given an ulcer or an abscess cavity anywhere in the body, as every surgeon knows, chronicity will be the rule if the lesion is subjected to pull and tug, to constant motion, and to stretching. Furthermore, when raw surfaces are unable to come into close contact healing cannot progress favorably. This is true whether the underlying pathological lesion is tubercular or non-tubercular, whether situated in the lungs or in other parts of the body. The converse of this is also true.

In 1885, de Cerenville of Lausanne practiced the resection of ribs overlying cavities due to tuberculosis. The following year Quinke proposed small rib resections for non-cavernous types of the disease, as well as for cavernous types. In 1901 Garre and Quinke advocated thoracoplasty for hemoptysis. During this early period the operations were for the most part void of results. Brauer, an internist, in 1906 argued that not enough of the bony thorax was being removed. Friedrich, upon Brauer's suggestion, effected a complete removal of the second to the ninth ribs inclusive from the transverse processes around to the junction of the cartilages in front. This extensive rib resection produced some cures but the mortality was terrific. This led to the development of the Wilms-Sauerbruch operation as practiced today throughout the world. It was popularized by Sauerbruch, now working at the Charite Hospital in Berlin. However, many of the essential details were first suggested or practiced by others. Thus Brauer suggested a two-stage procedure in place of the one-stage which carried a prohibitive mortality of about 50%, due to surgical shock. Brauer also suggested resecting the ribs subperiosteally to allow regeneration of bone and prevent chest wall flutter. In the extensive operations of Friedrich, many patients died within a month from anoxemia brought about by chest wall flutter with its concomitant mediastinal flutter because of the absence of all bony support. Resection of the ribs paravertebrally was introduced by Wilms in 1911 on the basis of experimental work conducted by Gourdet in 1895. Gourdet proved that small paravertebral resections effected a greater diminution in the size of the chest cavity than that which could be obtained by similar resections laterally or anterolaterally. He showed the importance of removing the ribs as far posteriorly as the transverse processes. Sauerbruch was original in including the first rib and the tenth and eleventh ribs in the paravertebral resection. In 1924 he declared that the first rib must be shortened under all circumstances.

Thus in the modern operation, known as extrapleural paravertebral thoracoplasty, four to twelve centimeters of all the ribs, excepting the twelfth, are resected subperiosteally from the transverse processes forward. Graded thoracoplasty, as advocated by Hedblum, divides the operation into three, four or more stages, according to the demands of the individual case. The entire operation should never be done in less than two stages. Division of all the ribs close to the spine allows the thoracic wall to be drawn downward and inward by the constant though slight suction within the chest, as well as by contraction of the muscles of the trunk. All supports, including in particular the first and eleventh ribs, must be severed. This method has proven effective in hundreds of cases and has entailed a comparatively low mortality. Having been made relatively safe, the applicability of the procedure has been greatly increased so that today many more patients are receiving its benefits than was thought possible five or ten years ago.

On this continent, according to Archibald, up to 1914 only three thoracoplasties had been performed. Since then about 1500 have been carried out. To Alexander of Ann Arbor, Archibald of Montreal, and Lilienthal of New York belongs the credit of popularizing in this country this operation first conceived and perfected in Germany.

The judicious selection of patients for operation will insure a high percentage of good results following surgical interference. Surgical treatment should be considered in all unilateral cases that do not respond favorably after a reasonable period of treatment at a well regulated sanatorium. Of these unilateral cases that come up for consideration, only the ones who possess sufficient natural defensive powers to tuberculosis will be selected for thoracoplasty. In this selection of cases, the clinical progress and roentgenological data are of the greatest importance. Archibald has grouped such cases into three main classifications. And though few cases fall definitely into any one of these classes, yet, a useful guide is supplied:

First: There are the "good chronic" cases.

Second: There are the chronics who are showing signs of slipping.

Third: There are the bad chronics.

The good chronic patient is one who has given proof of defensive powers because he is a chronic. He is not getting any better nor is he getting worse. His general condition is good, there is persistent cough, and a moderate amount of sputum positive for tubercle bacilli. Roentgenologically, there is evidence of scar tissue formation and contraction; cavity formation is present but not excessive. The patient is condemned to spend the rest of his life curing.

The chronic patients who are showing signs of slipping even with bed rest, present slight fever and an elevated pulse. They have shown evidences of fibrotic contraction in the past, but this is now slowly failing.

The bad chronic patients present persistent fever, marked elevation of the pulse and a steady loss of weight. There is evidence of considerable and increasing cavitation. In this last group, the underlying pathological changes in the diseased lung will determine the advisability for or against operating. It is in this group that an injudicious selection makes for a high mortality and for poor results.

There is a fourth class of patients in which persistent recurring hemorrhages predominate in the clinical picture. Flare-ups of fever, elevation of pulse and malaise accompany each hemorrhage. When pneumothorax cannot be induced, thoracoplasty promises good results in many of these patients.

Each patient who comes up for consideration is carefully studied to determine the predominant pathological status in the bad lung. Here the X-ray studies are an essential aid. From this viewpoint, the predominantly fibroid or productive type of tuberculosis is the most suitable for surgical collapse therapy. In contradistinction to the above, there is the type of tuberculosis in which the predominant lesions are of an exudative nature with little or no tendency toward scar tissue formation. This is not a favorable type for surgery.

Thoracoplasty is not a cure for tuberculosis. It promises only to be an aid to nature's way of healing. In the good chronic cases, there is evident on X-ray examination a contraction of the hemithorax. This is accomplished essentially by scar tissue contraction. There is effected a narrowing of the interspaces between the ribs, a pulling over of the mediastinum and an elevation of the diaphragm. Further, the mobility, during respiration, of the diseased side of the thorax is greatly diminished. All these phenomena occur naturally in patients who show resistive powers to the ravages of the disease. All these things thoracoplasty tries to effect more completely.

Thus, following thoracoplasty, the cut rib ends spring inward and downward, narrowing the interspaces. Regenerated bone bridges the remaining gaps between the cut ends of each rib as well as between adjacent ribs. This causes fixation of the chest wall, so that, with the addition of phrenicectomy to paralyze the diaphragm, practically all respiratory activity of the diseased lung is removed. The lung is placed at anatomical and physiological rest and is reduced in volume to about 30% of its normal cubic capacity.

Anatomical rest of the lung, combined with the compressing effects of the operation, brings about a stasis of lymph, and a passive congestion of blood. This results in a remarkable stimulation of fibrous tissue growth. Lymphatic absorption of toxic products from the diseased lung ceases. Compression of the lung, aided by the profuse proliferation of fibrous tissue reduces the size of cavities; and by bringing their walls into apposition their healing and ultimate obliteration is made possible. All of the phenomena mentioned above have been dem-

onstrated by clinical observation, by X-ray evidence, by means of experiments with animals, and finally by autopsy studies in patients who have died many years after a thoracoplasty.

Recent figures in large series of cases show an average mortality directly attributable to operation to be about 13%. This occurred in 1,159 patients, the composite statistics from operators all over the world collected by Alexander in 1925. In these 1,159 cases there were 61% favorable results with 36% actual cures. In the words of Alexander, "this is a remarkable record in view of the fact that scarcely one of these patients was expected to survive his disease by continuing with artificial pneumothorax and sanatorium régime."

A more detailed idea of results following thoracoplasty is given in a series of 172 cases reported by Archibald in 1929. (Let us recall that he groups his patients into the "good chronics," the "chronics who are slipping," and the "bad chronics.") Of good chronic cases he had 47, with 4% mortality and 80% favorably influenced. Of conditional chronic cases he had 71, with 4% mortality and 62% favorably influenced. Finally, of bad chronic cases he had 54, with 26% mortality and only 20% favorably influenced. (Of the entire 172 cases, there were obtained 104 practical cures.)

To maintain a low mortality it is important to make a careful selection of cases. However, as Lilienthal has stated, "it cannot be to the credit of surgery to refuse help in any case, no matter how desperate, merely to improve statistics."

Further, to maintain a low mortality it is important to avoid doing too much at any one time. Judgment in determining when the patient has had enough operating is most important. In one of the European clinics I remember seeing a surgeon perform a complete thoracoplasty at one sitting. He worked so well that only 35 minutes were consumed in the entire procedure. I saw him carry out three such operations and in each instance the patient died within two or three days post-operatively. The operation was beautifully executed but the physiological derangement of the cardiac and respiratory functions was too marked in its suddenness and simultaneous extent for the patients to withstand without fatal issue.

The development of acute tuberculosis or of aspiration pneumonia in the sound lung accounts for most deaths. Paroxysmal respiration and mediastinal flutter with loss of vital capacity contribute to the mortality. Wound sepsis accounts for a few deaths.

Final results in this field of surgery are usually tabulated according to the suggestion of Dr. Sauerbruch, who has done more of this work than anyone else in the world:

1. *Apparent complete cure* implies freedom from any symptoms of tuberculous activity for at least one and one-half years, no sputum, and ability to perform a full day's work.

2. Clinical cure implies freedom from any symptoms of tuberculous activity for at least one and one-half years, no more than a few cubic centimeters of sputum without tubercule bacilli, and ability to do a satisfactory day's work.

In addition, of course, there will be cases who show great improvement, some who show slight improvement, some who are worse, and finally there will be the deaths. At the end of a five-year period in a large series of cases one may expect:

Cures	33%
Improved	33%
Unimproved, worse, or died	33%

Now this is most encouraging since thoracoplasty is offered to a class of patients having the far advanced type of tuberculosis with cavitation, in whom all conservative forms of therapy have failed, and of whom only 10% would still be alive at the end of the same five-year interval without surgical intervention. These facts were convincingly brought out by Dr. H. L. Barnes from his study of 1,454 tubercular patients with cavities in their lungs, covering a period of 22 years. Eighty-five per cent of these patients died within three years, and 90% died within five years after the recognition of their cavities. Eighty-two per cent of patients with small cavities died within three years. This was true also of patients who presented "honeycombing" on X-ray examination.

Eight cases* of thoracoplasty have been carried out at the Miriam Hospital during the past eleven months. (To April, 1932.) Too short a time has elapsed to warrant reporting results in these patients. However, a preliminary report may be justified merely stating whether the operation thus far has favorably or unfavorably influenced the patients' disease and general condition. In this small series of eight cases, embracing twenty-four separate operations, there has been no mortality; six have been favorably influenced, and two unfavorably. Of seven patients who had a positive sputum

before operation, three have been persistently negative since operation. Of six patients who showed streaks of blood in their sputum, five have not streaked since the operation. During the course of the ensuing years these patients will be carefully followed to determine the true end results.

I wish to express my gratitude to Dr. H. L. Barnes, Superintendent of the State Sanatorium at Wallum Lake, R. I., and to the Trustees and Staff of the Miriam Hospital, Providence, for making this work possible. Thanks are also extended to Dr. Isaac Gerber for his valuable aid in the roentgenological aspects of the work, and to Dr. M. Saklad for his interest in the special anesthesia problems.

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*Since this paper was read the number of cases has been brought up to a total of 18, embracing 52 operations. There has been no operative mortality. One patient died 10 months after operation from the natural progress of his disease complicated by generalized lymphadenopathy. One patient is unimproved, and 16 are improved. Of these 16 patients, 6 are free of all symptoms of tuberculosis, 5 are greatly improved, and 5 are moderately improved. Of the 17 patients still living, 16 had tubercle bacilli in their sputum before operation, 12 of these are now negative; 10 had blood in their sputum before operation, 7 of these have not shown blood in their sputum since operation.

EXTRA-PLEURAL THORACOPLASTY IN PHTHISIS*

RESULTS IN 22 CASES

By Dr. Harry Lee Barnes

Wallum Lake, R. I.

Our first case selected for Thoracoplasty was sent to Dr. Howard Lilienthall in 1921, but after going to New York she lost courage and declined the operation. The first of our cases to be operated on was by Dr. Lilienthall in 1925. Since then 22 of our patients have received extra-pleural Thoracoplasty.

These patients were all predominantly one-sided cases. All had had the bed rest, good food, open air sanatorium regimen for periods varying from a few months to several years.

In all of these cases, pneumothorax treatment had been tried by our staff. In 11 cases we had been unable to establish pneumothorax and in 11 a limited pneumothorax had been established, which had tended to check but had not cured the disease. Pneumothorax treatment was followed by negative sputum in two of the cases.

Phrenicectomy which had been performed in 12 or 54 per cent of the cases had been followed by a closure of cavities in one case, negative sputum in

*Discussion of Dr. Windsberg's paper on "Thoracoplasty," at a meeting of the Providence Medical Association, May 2, 1932.

one other case, and a limited amount of benefit in a few more, but it had failed to cure.

Two of the four negative sputum cases had had repeated attacks of streaked sputum, the loss of blood being small, while the third case had recently had enormous pulmonary hemorrhages which had brought him near death. The fourth negative sputum case had tuberculous empyema.

Eighteen of these twenty-two patients still had tubercle bacilli in the sputum and twenty-two had X-ray evidence of cavities. All these patients were well nigh hopeless from the standpoint of cure, but we might expect them to live on for periods varying from a few months to a few years, until the spread of the lesions in the good lungs terminated life.

As all of these cases were patients at the State Sanatorium who were sent to hospitals in Boston, New York, Ann Arbor or Providence for operation, the surgical work is unknown to me except from the reports, and it will not be considered in detail.

Most of these patients had three stage operations but in at least two there were four stages, as anterior or lateral costectomy was added to the usual posterior operation.

Patients who accept thoracoplasty must take the risk of mortality from the operation, which in this series was only 4.5 per cent, and the risk that the operation will fail to give adequate collapse, which in this series was about 20 per cent. This last risk should be reduced in the future through improved technique and skill of the operators. The risk of a spreading lesion in the contra-lateral lung has amounted to about 22 per cent and defeats the purpose of the operation, but it should not be charged to the operation, for without this operation nearly all the patients will sooner or later have the same condition. Even though there appears to be a good surgical collapse resulting from the operation and even though there is no spread of the lesion in the contra-lateral lung, yet some cases do not recover.

I am hopeful that to the 22.7 per cent of these patients who have been restored to work there will be added enough to bring the total to 40 per cent restored to work. Although we would like to see a higher percentage, yet considering that the outlook was well nigh 100 per cent hopeless without operation, we are encouraged by the results which we have obtained. I am greatly pleased that we have, in Rhode Island, a man with some training and experience in thoracoplasty for pulmonary tuberculosis.

TABLE 1.

THORACOPLASTY, 22 CASES

	Cases		Percent
Sex.			
Men	7	=	31.8
Women	15	=	68.2
The Extensively Involved Lung			
Right	10	=	45.4
Left	12	=	54.6
The Contra-Lateral Lung			
Apparently Clear	9	=	41.0
Slightly Involved	13	=	59.0
Cavities			
Present	22	=	100.0

TABLE 2

RESULTS OF THORACOPLASTY

7 years to date

Tb. in Sputum			
Present before operation	19	=	86.3
Present after operation	12	=	54.5
Spread lesion to contra-lat.	5	=	22.7
Pneumonia Contra-lat. Lung. Death after 4 days	1	=	4.5
Empyema and Chr. Nephritis (Death after 15 mo.)	1	=	4.5
Lesion Contra-lat. lung (Death after 30 mo.)	1	=	4.5
Failing	2	=	9.1
Chronic and Unimproved	5	=	22.7
Improved	3	=	13.7
Much improved, Recovery probable	4	=	18.2
Resumed work, Symptom free	5	=	22.7
	22		99.9

TECHNIC OF OXYGEN THERAPY*

By ALBERT H. MILLER, M.D.

28 EVERETT AVENUE

PROVIDENCE, RHODE ISLAND

To supply oxygen to the tissues is the principal object of the complicated mechanism of circulation and respiration. The air which we breathe contains about 20% oxygen. The nitrogen is inert and serves only to dilute the oxygen. From the alveolar air, oxygen is taken into the circulation and is carried by the arterial blood stream to every tissue cell of the body. In the tissues, oxygen unites with carbon to form carbon dioxide, which is taken up by the venous blood and passes off in the expiration as a waste product. The expired air contains about 5.5% carbon dioxide and is saturated with moisture from the upper air passages.

*Read before the Providence Medical Association November 7, 1932.

The body may survive deprivation of food and water for long periods but interference with the supply of oxygen immediately produces alarming symptoms. The condition of anoxemia, produced by lack of oxygen, is characterized by cyanosis, a bluish discoloration of the skin noted especially on the lips and finger tips and due to an excess of reduced hemoglobin in the capillary circulation; dyspnea and other disturbances of breathing; an increased pulse rate due to the effort of the heart to supply more oxygen by circulating the blood more rapidly; an increase in the pulse pressure resulting from raising the systolic pressure and lowering the diastolic pressure; interference with the cardiac conduction system; dilatation of the heart; restlessness; delirium; and finally, unconsciousness.

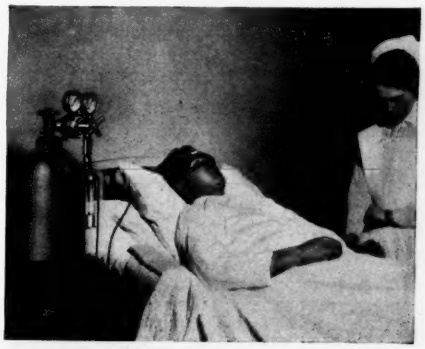
Our knowledge of oxygen commenced with experiments made with a large burning glass by Joseph Priestley[6], an English clergyman of Birmingham. On the first of August, 1774, he focused the sun's rays on some red oxide of mercury and noticed that bubbles of gas formed. He collected the gas and called it dephlogisticated air. In 1798, Thomas Beddoes[2] opened a Pneumatic Institution for treatment of disease by inhalation and used dephlogisticated air, now known as oxygen, in the treatment of such conditions as chlorosis, dyspnea, asthma and opium poisoning. From that time oxygen inhalation was used occasionally, but generally as a last resort and by ineffectual methods. The favorite procedure was to pass oxygen from a low pressure cylinder through a wash bottle and tube to a glass mouth piece or to a funnel held at some distance from the patient's face or at least pointed in the general direction of his nose and mouth. The method was both wasteful and inefficient.

In 1917, under the stress of conditions due to the war, Haldane[4] in England devised a mask which was successfully used in oxygen treatment of pulmonary edema following gas poisoning. At the same time, Meltzer[5] in New York was treating pneumonia with great success by the oral insufflation of oxygen. This work was further developed by Roth[8] at Battle Creek, by Barach[1] at the Presbyterian Hospital in New York, and by Boothby[3] at the Mayo Clinic. Oxygen inhalation is now used with marked success in pneumonia, in uncompensated heart disease, in asthma, emphysema, and in anoxemia from other causes. It is also used for stimulation of metabolism as in extensive burns and ulcerations.

The oxygen which we obtain compressed in cylinders is prepared in great quantities from liquid air. Atmospheric air is compressed by an air pump and is then allowed to escape into a large chamber where the sudden expansion causes intense cold which reduces the air to a liquid. When allowed to evaporate, the nitrogen passes off first leaving the oxygen to be collected and pumped into cylinders so that it can be transported and used. The large oxygen cylinders contain 220 cubic feet, about 1,650 gallons.

Oxygen inhalation can be carried out efficiently
by insufflation through a nasal tube,
by the face or nasal inhaler,
with an open cone,
with an oxygen tent, or
a portable oxygen room.

The stationary oxygen rooms are expensive to construct and are subject to a constant hazard from fire. The oxygen rich atmosphere does not burn nor explode but will fan to alarming proportions any flame which may gain entrance to the room.

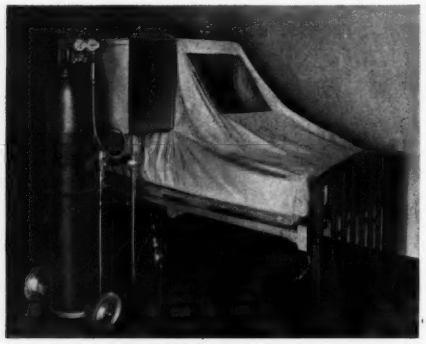


NASAL CATHETER

Nasal tubes for oxygen insufflation are rubber catheters, No. 8 or 10 gage. Several holes are made in the terminal half inch of the catheters so that a constant stream of the gas can not impinge on one spot in the pharynx. The flow of oxygen is controlled by a flow meter consisting of a reducing valve with a millimeter opening in the outlet. The oxygen bubbles through water in a wash bottle which serves as an additional indicator of the flow, moistens the oxygen and acts as a safety valve. The flow meter is calibrated in liters of flow per minute. About five liters per minute provides a 50% oxygen atmosphere and is usually sufficient to overcome anoxemia and cyanosis. The nasal tube is well lubri-

cated before introduction. The tip of the tube should lie in the oro-pharynx, distant from the nares by 4½ to 5½ inches. The tube is fixed to the cheek or forehead with a strip of adhesive plaster. Sufficient slack in the tubing is provided to allow free movement of the patient's head. Once in twelve hours, the nasal tube is removed and a clean tube introduced into the alternate nostril. If the nasal tube is correctly placed it provides an efficient device for oxygen therapy. With a flow of 7 liters the oxygen percentage may be as high as 70%[9].

The face inhaler for oxygen inhalation is provided with an inspiratory as well as an expiratory valve and does not allow rebreathing. Oxygen passes from a high pressure cylinder through a reducing valve, to a rubber supply bag which is automatically kept filled. On each inspiration, a mixture of oxygen with atmospheric air is drawn into the lungs. The percentage of oxygen is regulated by a control valve which determines the amount of air to be admitted. It may be set to deliver 50, 60, 70, 80, 90, or 100 per cent. of oxygen. The face inhaler requires constant attention to keep it properly fitted to the face and may be objectionable to the patient.



Portable Oxygen Tent

It is useful for brief periods in emergencies and for administering high percentages of oxygen, which it does efficiently and without waste. The nasal inhaler is more comfortable for the patient and requires less attention. If the patient's mouth can be kept closed, it is equally as efficient as the face inhaler.

Administration of oxygen with an open cone such as is used for etherization has proved to be a valuable and reasonably efficient method. The efficiency depends upon the fact that oxygen is slightly heavier than air, its specific gravity being 1.1056. An open cone seven inches high is closely fitted to the patient's face and held approximately in a vertical position. Oxygen is fed into the top of the cone and from its high specific gravity tends to constantly sink to the bottom. A flow of oxygen of 5 liters per minute has been sufficient to clear up marked cyanosis.

The oxygen tent is the most popular apparatus for continued oxygen administration. It is reasonably efficient, is comfortable for the patient and is readily transported. The tent itself is made of closely woven fabric rubberized on both sides. Windows of non-inflammable aceto-cellulose are conveniently placed in the front and sides of the tent. The capacity of the tent should be at least eight cubic feet. A square tent must measure at least twenty-four inches in each dimension. The tent is suspended over the head of the patient's bed on a metallic frame. The sides of the tent are extended below into a long skirt which is tucked under the mattress at the head of the bed and at the sides, and under the blankets or spread in front. The efficiency in operation of the tent depends largely upon the care with which the skirt is arranged.

In an efficient oxygen tent, the oxygen percentage, the percentage of carbon dioxide, the temperature and the relative humidity must be under exact control and the arrangement should be so far automatic as to maintain these factors constant over periods of hours or days without frequent attention.

Oxygen is supplied from high pressure cylinders through a reducing valve. The reducing valve has two gages indicating the tank pressure and the reduced pressure. If the flow of oxygen is limited by a capillary opening, the reducing valve is converted into a flow meter and the rate of flow is determined by control of the reduced pressure, otherwise the reduced pressure is set at about 20 pounds and the rate of flow is regulated at some other point in the system. To increase the oxygen in a standard tent to 50%, at least 150 liters of oxygen must be added. This increase may be effected slowly or rapidly depending upon the exigency of the case. At 10 liters per minute, the increase is effected in fifteen minutes. After the 50% oxygen atmosphere has been reached, a flow of about 8 liters per minute is required for maintenance with ordinary nursing care. With special attention to prevention of leakage, a 50% oxygen atmosphere may be maintained on a flow of 6 liters per minute. A test for the percentage of oxygen should be made frequently. 50%

is the usual figure. 30% is usually ineffectual and over 70% may be injurious. Without regard to theoretical percentages, a good rule provides for the use of sufficient oxygen to overcome the symptoms for which the treatment is required and no more.

The tent confines the animal heat constantly given off by the patient, especially if his heat production is increased by fever, and the contained atmosphere soon becomes too hot for comfort. To cool the tent, a chamber filled with ice is placed in closed circuit with the tent. The atmosphere is circulated through the tent and the ice chamber by one of three methods:

1. The thermo-syphon. The air in the ice chamber constantly becomes colder and sinks to the bottom of the chamber. The circuit is so arranged that this cold air constantly displaces the hot air from the tent and passes it back to the top of the ice chamber to be cooled in turn.

2. A pump or injector which maintains circulation of the air by utilizing the expansive force of the oxygen as it emerges from the high pressure cylinder is more efficient than the thermo-syphon system.

3. An electric motor blower is the most efficient means for controlling the tent temperature. With such a blower, controlled by a sensitive thermostat, the temperature in the tent can readily be maintained at any point between 60 and 72 degrees F., which are the limits within which the majority of patients find most comfort. The temperature depends upon the speed with which the blower circulates the air through the ice chamber and is independent of the rate at which oxygen is supplied.

The patient is constantly expiring carbon dioxide to the extent of 5.5% of his expired air. In the early tent models, carbon dioxide was absorbed in a chamber containing soda-lime (calcium sodium hydrate) which was included in the closed system through which the tent atmosphere circulated. The carbon dioxide absorption introduced a distinct element of danger. Without carbon dioxide absorption, an accidental interruption of the oxygen supply would produce the marked respiratory stimulation and discomfort of hypercapnia. With carbon dioxide absorption, a failure in the supply of oxygen would be unnoticed by the patient, who might quietly pass into a state of unconsciousness and might die unless the oxygen failure was noticed by the attendant in time. The modern tents do not employ carbon dioxide absorption but dispose of excess carbon dioxide in the following ways:

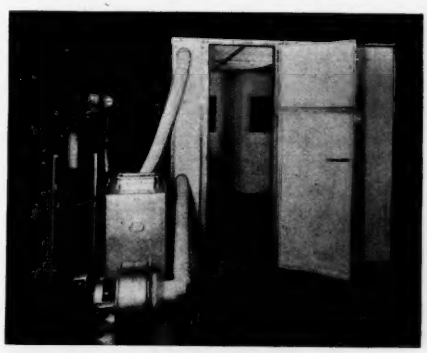
1. While the tent fabric is impervious to oxygen, carbon dioxide constantly diffuses through it.

2. Carbon dioxide is absorbed by the ice and cold water in the ice chamber.

3. The greater proportion of the carbon dioxide is lost by leakage, especially around the edges of the skirt of the tent. With extraordinary care to prevent leakage and an oxygen flow of 6 liters, the carbon dioxide in the tent may approach 4%, but this increase is not accompanied by any subjective symptoms. With an oxygen flow of 8 to 10 liters, the carbon dioxide will not rise above 1.5%[7].

The humidity inside the tent is constantly increased by the moisture of the patient's expiration. To insure comfort, the relative humidity of the tent atmosphere should be kept at less than 50%. This is accomplished by precipitation of the moisture as the air is circulated through the ice chamber. The relative humidity may readily be tested with the wet and dry bulb hygrometer. With the efficient ventilation of the motor blower outfit, no difficulty is encountered in disposing of the excess water vapor. With the thermo-syphon system, it may be impossible to keep the humidity down to the point of greatest comfort.

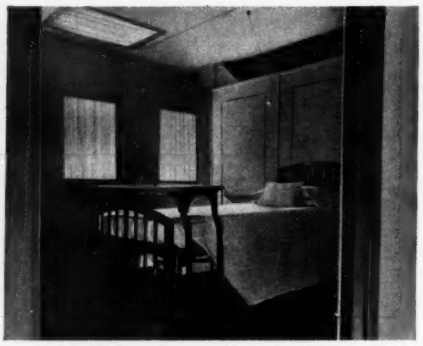
The portable oxygen room is a tent large enough to contain the patient's bed and other furniture. It may be enlarged so as to provide for several patients. The room is constructed of rubberized fabric mounted on an angle iron frame. The room is



PORTABLE OXYGEN ROOM

lighted by aceto-cellulose windows. The oxygen supply, ventilation by a motor blower, and the ice chamber are similar to those used with the standard tent but are on a more extensive scale. For an

oxygen chamber 8 by 8 by 9, two large cylinders of oxygen are used for the initial charge and a flow of 10 to 12 liters is required to maintain a 50% oxygen atmosphere. A powerful ventilating fan is provided and the ice chamber has a capacity of 300 pounds. Excess carbon dioxide is disposed of by leakage, by absorption in the ice chamber and by diffusion through the extensive surface of rubberized fabric.



PERMANENT OXYGEN CHAMBER

The stationary oxygen room is an air tight steel chamber. At one end of this chamber are brine coils connected with a refrigerating plant and pans of soda lime for carbon dioxide absorption. At the other end is a steam radiator. The convection current which ventilates the room passes up through the steam radiator and downward over the brine coils and through the soda lime. The stationary room is very economical of oxygen, as there is but slight leakage, and after the initial charge the entire oxygen requirement is limited to the amount needed for the metabolism of the patient and attendants who occupy the room. Excess moisture condenses on the brine coils. In the stationary room the oxygen percentage, the temperature, humidity, and the carbon dioxide percentage are under very exact control. The fire risk is considerable. Matches are not allowed to be brought into the room. No electric wiring is placed inside the chamber. Electric lights are arranged outside the windows. Signs are prominently displayed reading, "No flames, No sparks, Danger." There is less fire hazard from the portable tents and rooms, but enough for serious consideration. The smoldering flame of a match or a cigarette flashes up in a 50% oxygen atmosphere and may start a serious conflagration.

Minute traces of oil in the tubes transmitting oxygen may explode with violence. Explosions have occurred in industrial plants from such trivial lapses as wiping the outlet of an oxygen cylinder with a workman's greasy fingers. Oxygen gages are conspicuously labeled "Danger. Do not oil."

Successful oxygen therapy depends upon close attention to many details. The apparatus must be kept in perfect working order. Spare parts should be kept in readiness for an emergency. The oxygen percentage must be carefully maintained. If the oxygen supply fails from any cause, the treatment must be suspended and the patient immediately removed from the tent or oxygen room. Excess carbon dioxide must be efficiently disposed of. The most favorable temperature and relative humidity must be determined and then carefully maintained at the optimum point. Water must be drained from the ice chamber at regular intervals lest accumulation of water interfere with the required ventilation. The possibility of explosion or of fire risk must be constantly kept in mind and guarded against. A patient who has been under continuous oxygen treatment must not have the treatment suddenly discontinued. The oxygen percentage should be gradually reduced and the patient carefully watched for unfavorable reactions.

This careful attention is well worth while. In oxygen treatment, excepting the opiates and anesthetics, and the action of some of the serums and organic extracts, we have the most valuable therapeutic measure at our disposal.

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EDITORIALS

CONSTRUCTIVE CRITICISM—THE MATERNITY WARD

Lay criticism of medical activities is as a general rule of little import as it is usually based upon anything but fact. When, however, the criticism comes from within the profession itself, it should indeed be heeded. The recently published statements of Drs. De Lee and Siedentopp regarding the prevalence of maternal infection and the relatively high maternal death rate from puerperal sepsis in the maternity wards of general hospitals, are backed by an array of facts collected on both sides of the Atlantic by Professor Siedentopp, which makes it imperative that the profession "sit up and take notice." It is evident from the material presented that the average woman is far safer as far as sepsis is concerned when delivered in a hovel by an ignorant midwife than when she enters the fully equipped maternity ward and is attended by the highly trained physicians of the staff. This seems almost beyond belief and yet there are the facts! Can it be that the obstetric specialist and the associated nursing staff are negligent in their duty and fail to carry out in detail the prescribed technical

procedures or have the midwives in spite of their relative ignorance become the possessors of some charm which they pass on one to another in all lands where they are employed? Neither explanation is tenable. The fact must be, as De Lee points out, that infections are brought into the maternity wards from outside and especially from other parts of the general hospital and passed, principally by indirect contact, from patient to patient. This is probably most often, as Chapin has shown in the case of contagious disease, by means of the hands of doctors, nurses and attendants. Even the most careful technique, such as is so well exemplified in the wards of the Charles V. Chapin Hospital, occasionally breaks down and cross infection occurs. How much more is this likely to take place in the general hospital where such time-consuming and laborious methods of medical asepsis are not, and perhaps cannot be enforced. With Dr. De Lee's idea that air-borne infection is an important factor, one who is familiar with the work of Chapin and Richardson on the transmission of contagion is not impressed.

Nevertheless, however transmitted, the fact of the prevalence of puerperal infection is only too evident and something must be done. In order to preserve the obvious advantages of hospitalization of parturient women, their complete segregation in separate hospitals must be accomplished, better isolation of the individuals must be insisted upon and more "medical asepsis" must be enforced by rigid technique which is required of student nurses and physician alike. When the more favorable results of the work of midwives as compared to physicians in the home is considered, one is forced to the conclusion that the fact that the practitioner may be dealing daily with virulent infections among his clientele while the midwife is not, may indicate the doctor a much greater menace to his parturient patient—a handicap that he can overcome in no other way than by recognizing its existence and by practising to the limit the appropriate technical precautions.

THE CERTIFICATION OF SPECIALISTS

In connection with the recent publication of the reports of the Committee on the Costs of Medical Care a great deal of attention has been focused upon the general practitioner and his importance in any scheme of medical care. This attention is of great value and should serve to bring about a proper recognition of the great service rendered to the community by this type of practitioner. Of equal importance, however, is a realization that we must have qualified specialists to supplement the work of the general medical man. At the present time there are no legal requirements for or restrictions upon the practice of special branches of the healing art; any legally qualified practitioner may hold himself out as a specialist regardless of his fitness or qualifications. This is an unfortunate situation and one which calls for early action. The report mentioned above[1] states — "The practice of specialties should be limited to those persons whose training or experience gives them a skill in their field distinctly above that which ought to be possessed by all well-trained general practitioners." The problem is also recognized in the final report of the Commission on Medical Education[2] as follows—"The medical profession and the public have a joint responsibility in guaranteeing that those who claim to be specialists are in fact experts in their fields. A particular identification for those who profess to be specialists should be created, such recognition to be granted only on evidence of the successful completion of a training which in the opinion of competent physicians is adequate to prepare the individual for practice in the limited field."

At the present there are certain praiseworthy voluntary movements directed toward a solution of this problem. The formation of the American College of Surgeons and of the American College of Physicians, and of the various special examining boards have as their object the raising of the standards within their special fields. They do not, however, prevent the untrained man from claiming special ability. Many proposals for accomplishing this have been made. It has been suggested that the National Board of Medical Examiners extend its examinations to include the examination and certification of specialists. Another suggestion is that State Boards assume this function. The most interesting suggestion, however, is that State Societies certify as to the qualifications of those claiming to be specialists. The Medical Society of New Jersey[3] has devised a carefully worked out plan for accomplishing this purpose, and this plan has many attractive features.

What must be realized is that the subject is receiving an increasing amount of attention from medical men and thoughtful laymen, and some action will undoubtedly result. We shall be wise to

study this matter with care and to lead in its solution, rather than having some well-meaning but ill-considered plan forced upon us by legislative enactment.

(1. "Medical Care for the American People"—The Final Report of the Committee on the Costs of Medical Care—University of Chicago Press, 1932.

2. "Final Report of the Commission on Medical Education"—New York, 1932.

3. "Certification of Specialists by the State Society"—Waters, E. G., A. M. A. Bulletin, XXVIII, 1, January '33, 6-11.)

Publishers' lists of new books show an increasing number, of late, devoted to the history of medicine. Most medical colleges now offer courses in such history.

These facts show a definitely renewed interest in the subject on the part of doctors, for publishers were loath to accept for publication such books a short time ago.

Many of our greatest medical men had more than a passing interest in medical history. Sir Clifford Allbutt, Sir William Osler, Cushing, and a host of other great figures in the profession are examples of those whose zeal for the subject resulted in valuable contributions. The interest, therefore, by the profession is a good omen. No one, it would seem, could know well any disease without knowing its history. No one greatly interested in a subject could help being curious about its past or could help being benefited by such knowledge.

Further, the more one reads of ancient medicine the less he is likely to talk about the advances of "Modern Medicine." One sometimes feels as if the ancient Greeks knew all the essential and important facts about most of medicine as we know it today. This is particularly true when we realize only a small portion of their writings were preserved for us.

The desire for historical knowledge by the profession is, indeed, commendable. The cultural aspects are important. The power to evaluate facts more correctly, however, will always remain the greatest asset of medical history and a general acquisition of such knowledge raise the standard of the profession.

THE HEMOLYTIC STREPTOCOCCUS*

By D. L. Richardson, M.D., and H. Everett Smiley, M.D.

The hemolytic streptococcus is one of the worst enemies of man. It causes such diseases as scarlet fever, puerperal septicemia, erysipelas, septic sore throat, pneumonia, meningitis, peritonitis, endocarditis, tonsillitis and pharyngitis, and septic infection of accidental or operative wounds which are so often followed by septicemia.

In 1929 according to the United States Mortality statistics of the Registration Area 2,468 persons died of scarlet fever, 5,822 of puerperal septicemia, 2,887 from erysipelas and 1,208 from purulent infection and septicemia. The figures by no means include all the deaths caused by the streptococcus hemolyticus for a great many were included in other diagnoses such as mastoiditis, peritonitis, accidental wounds in which this organism was the chief factor although not mentioned.

With the exception of scarlet fever, of which there are in the neighborhood of 300,000 reported cases each year, there is no way to accurately estimate the number of hemolytic streptococcus infections which occur each year and which are not fatal. It is unnecessary to argue that it is very common and probably much more common than generally believed. There is convincing evidence that a considerable percentage of comparatively mild infections of the nose and throat are caused by this organism. This will be brought out in the chart which will be shown later.

Moreover, the streptococcus is a real menace in hospitals and many times in child caring institutions. A great many outbreaks of this infection has occurred in the Lying-In hospitals of this country with disastrous results. So serious has been this menace that in Chicago the Lying-In hospital has been built in two parts, one for clean cases and one for infected cases. Puerperal sepsis, infected breasts, scarlet fever, erysipelas and other infections have caused these hospitals great concern and discredit.

This infection, however, is not confined to this type of hospital for the general hospital is frequently visited by both mild and fatal streptococcus infections among patients, nurses and physicians. Every so often a series of post-operative infections is experienced by any sizable hospital.

*Read before the Providence Medical Society, December 5, 1932.

All these infections should, from an epidemiological standpoint, be grouped together as hemolytic streptococcus diseases. By doing this it may be possible to put into operation measures both in community and the hospital, measures which may be of sufficient value to decrease the incidence of this type of infection very materially.

These infections do not just happen for there are very definite epidemiological reasons for their existence. In spite of the fact that there are many strains of the streptococcus and no ready laboratory methods of distinguishing them it is advisable to start with the premise that every streptococcus infection is potentially a menace to the patient and those who come in contact with him. It is perhaps not generally realized how frequently mild throat and respiratory infections are caused by this organism and that a certain percentage of the population are constantly carrying these organisms in the nose and throat even when not ill. The sources of infection of this disease, if it may be so termed, are exactly the same as in the case of other infectious diseases, namely, the recognized cases, the unrecognized cases and the carriers.

Some contribution in the study of this problem has been made at the Chapin Hospital beginning in February, 1928. Primarily it was begun to learn whether the routine laboratory examination of throat cultures for the streptococcus hemolyticus would shed any light on assisting in the diagnosis and release of scarlet fever patients. For many years a routine nose and throat culture was taken on all patients admitted to the hospital to detect diphtheria and diphtheria carriers. For this purpose the standard Loeffler's culture medium had been used.

In a paper by one of us and Dr. Edwin Knights of the laboratory staff read before this Society and published in the State Journal in 1929 a summary of the work carried on for one year to determine not only what patients had on admission diphtheria organisms in the nose and throat but also hemolytic streptococci. During previous experiments it was learned that blood agar plates served not only to detect with accuracy the presence of the streptococcus but also the diphtheria bacillus. In fact this medium was found to be quite or even more satisfactory for the growth of the diphtheria bacillus.

This practice has been continued until the present time and this paper includes a further report on the incidence of the hemolytic streptococcus among hospital patients extending from Feb. 1, 1929, to Nov. 30, 1930. It should be borne in mind that both reports were made from data on culturing consecutive patients as they were admitted and not a selected group. The following table shows the incidence of this organism in certain selected and grouped diseases.

TABLE I

February 1, 1929, to November 13, 1930

	Total No. of cases	Avge. No. cultures per case	Total No. and % of cases	Total No. and % of cases	Total No. and % of cases positive	Total No. and % of cases negative
Scarlet fever	369	6—7	265—71.8	55—14.9	320—86.7	49—13.3
Tonsillitis	110	2—3	54—49.0	13—11.8	67—60.8	43—39.2
Diphtheria	236	4—5	54—22.9	39—16.5	93—39.4	143—60.6
Pharyngitis } Laryngitis }	141	2—3	26—18.4	17—12.0	43—30.5	98—69.6
Erysipelas	76	2—3	12—15.7	14—18.4	26—34.2	50—65.9
Measles	140	2—3	21—15.0	18—12.9	39—27.8	101—72.1
Whooping cough	146	2—3	12— 8.2	17—11.6	29—19.7	117—80.2
Influenza	17	1—2	0— 0	3—17.6	3—17.6	14—82.4
Other Diseases	1669	2—3	146— 8.7	142— 8.5	288—17.3	1381—82.7

A corresponding table of cultures reported in 1929 is as follows:

TABLE II

February 1, 1928, to January 31, 1929

Scarlet fever	335	.....	240—71.6	39—11.6	279—83.3	56—16.7
Tonsillitis	62	.....	30—48.4	2— 3.2	32—51.6	30—48.4
Diphtheria	216	.....	34—15.7	28—12.9	62—28.7	154—71.3
Pharyngitis } Laryngitis }	75	.....	19—25.3	7— 9.3	26—34.7	49—65.3
Erysipelas	35	.....	10—28.6	1— 2.3	11—31.4	24—68.6
Measles	287	.....	20— 6.9	16— 5.6	36—12.5	251—87.4
Whooping cough	47	.....	4— 8.5	1— 2.1	5—10.6	42—89.4
Influenza	72	.....	5— 6.9	3— 4.2	8—11.1	64—88.9
Other Diseases	278	.....	12— 4.3	17— 6.1	29—10.4	249—89.6

Comparing these two tables it will be noted that in the first report, table 2, the total positive cultures in scarlet fever cases was 83% and in this second report, table 1, about 87%, a rather consistent experience. In tonsillitis it was 48% in the first study and in the last it was 60%, a decided increase. In pharyngitis and laryngitis it was 34% and 40%. In erysipelas it was 31% and 35%. It will be noted that routine cultures in measles, whooping cough, diphtheria, influenza and other diseases the incidence of hemolytic streptococcus carriers was much greater in the most recent study, 20% compared with about 11% in the first study in 1929. The explanation for this is not quite clear. It is possible, however, that our technique was better and certainly the average number of cultures taken on each case are larger now than during the first year in which this study was begun. On the other hand it may be that the incidence of carriers in the community is greater. Certainly the number of cases of scarlet fever in the city has been unusually high during the last three years.

It is interesting to note that at the present time the practicing physicians in the city are more and more insistent that the Health Department report on the cultures which they take, not only on the presence of diphtheria organisms but also on the presence or absence of hemolytic streptococci.

The practical results of this study are as yet not fully evident. However, certain procedures seem to be logical and some of them have been found to be of much service.

The diagnosis of scarlet fever alone on the cultures is not justified but the presence of the streptococcus is strong presumptive evidence and confirmatory. As yet it has not been found to be safe to discharge cases from the hospital or from home isolation on cultures alone although it has been used to some extent. A complete study of discharged cases of scarlet fever for four years will soon be made to help clear up this point. In institutions it has been found a great help when scarlet fever has appeared not only to isolate all cases but also all streptococcus carriers. It is quit clear also that all cases of hemolytic streptococcus, mild or severe, and all carriers should be isolated. There are strong reasons to believe that were this done there would be fewer wound infections, fewer throat and scarlet fever infections among nurses, and fewer outbreaks of sore throats among patients, particularly children, and fewer streptococcus infections in lying-in hospitals.

It is quite probable that if nose and throat infections were more generally cultured for the hemolytic streptococcus that some over-looked cases of scarlet fever would be recognized, that in any case if the physician would, if he knew that these organisms were present in the throat cultures, be more conservative in his diagnosis and hurrying convalescence, and advise the family to keep away from the patient and employ aseptic technique to protect other members of the household. Every physician is on his guard in every case of streptococcus infection, providing he is aware of it.

As to producing artificial immunity and the treatment of these infections by serum much remains to be done. This problem has intrigued research workers for years. There are so many strains of the organism, the toxin is so powerful and immunological results so variable that the answer to the problem has not been found. However, progress has been made and it is not impossible that a toxin will be found which not only will not cause severe reactions but also will produce real immunity in the case of scarlet fever so that what is being done to stamp out diphtheria may be feasible in the case of scarlet fever. Not only this but similar means of effective immunization or treatment of other streptococcus infections may be found.

This paper has been written to point out certain epidemiological features of this group of streptococcus diseases and some of the things which might be done to recognize and prevent at least some of them.

SOCIETIES

The Rhode Island Medical Society
Council Meeting

February 16, 1933.

The regular quarterly meeting of the Council was held Thursday, Feb. 16, 1933, at 4:30 P. M., at the Medical Library, with the President, Dr. N. D. Harvey, presiding.

The minutes of the last special meeting of the Council were read and adopted.

In the absence of Dr. A. T. Jones, the Secretary brought to the attention of the Council the matter of the Walter Reed Fund which was collected by the committee headed by Dr. C. D. Sawyer as part of a nation-wide appeal for funds to purchase the birthplace of Dr. Walter Reed. The Chairman of this committee has the funds which were collected by the committee, but is unable to get any response from the Central Committee at Washington which initiated the move, relative to the disposition of the moneys collected in Rhode Island. The matter was continued until the next meeting on account of the absence of Dr. Jones.

Dr. J. A. Chase reported with reference to the motion of the Council at the last regular meeting that the New England Medical Council, to which this Society sends delegates to four meetings held annually for the purpose of discussing problems of interest to the New England State Medical associations, be conferred with in regard to a different allocation of expenses, that he had communicated with the Secretary calling his attention to the feeling that the one-sixth share of the total expense of the Council borne by the Rhode Island Medical Society appeared excessive to the Council of the Rhode Island Medical Society, and expressed the hope that a more equitable distribution of the costs might be devised by the New England Medical Council, and suggested that the expenses be based upon the membership of the several New England State Medical societies rather than upon the geographical basis of states. No reply has as yet been received from the New England Medical Council.

Dr. George Waterman, Chairman of the Committee on Education, State and National, presented the following report, and it was voted that the Council recommend to the House of Delegates the adoption of this report:

"To the Council of the R. I. Medical Society:

"The Committee on Education has the following report to make on an educational measure which has been brought to its attention for use in the High Schools in Rhode Island.

"This measure consists in the publishing of a pamphlet entitled, 'Opportunities for Training and Work in Nursing in Greater Providence,' which it is proposed by the authors, sponsored by the Providence School Committee, to place in each of the High Schools in Rhode Island. This is part of a general plan of the Committee to place before high

school students outlines of the various vocations.

"This pamphlet has been very carefully prepared. It has gone quite thoroughly into the whole question of nursing as an occupation and has given quite impartially the advantages and disadvantages of nursing in general and it gives in quite detail the requirements of each of the Schools of Nursing in Providence.

"It is the understanding of the Committee that the school authorities wish to publish this pamphlet in co-partnership with the Rhode Island Medical Society; that the expense of publication should be divided between the two parties and that the expense to the Rhode Island Medical Society shall not exceed $50.00.

"The Committee has considered the matter at a meeting held at the office of Dr. Leech and feel that this is a worthy object and one that the Society might well lend its name in advancing. The Committe, therefore, recommends to the Council and the House of Delegates that they give favorable consideration to this proposal and appropriate a sum not exceeding $50.00 to carry out its part of the program.

Respectfully submitted,
GEORGE WATERMAN, *Chairman*
ROBERT BALDRIDGE, CHARLES FARRELL, N. DARRELL HARVEY, JAMES W. LEECH } *Members*
Ex-officio Members"

Adjourned.

Respectfully submitted,
J. W. LEECH, *Secretary*

HOUSE OF DELEGATES

February 16, 1933.

The regular meeting of the House of Delegates was held Thursday, February 16, 1933, at 5 P. M., at the Medical Library, with the President, Dr. N. Darrell Harvey, presiding.

The report of the Council was presented by the Secretary, and on motion, duly seconded, it was voted that the House of Delegates approve the action of the Council in recommending the adoption of the report of the Committee on Education, State and National, as presented by Dr. George Waterman, Chairman, for the publication by the Rhode Island Medical Society, jointly with the Providence School Committee of a booklet entitled, "Opportunities for Training and Work in Nursing in Greater Providence," which it is proposed to place in each of the high schools in Rhode Island.

The President, Dr. N. Darrell Harvey, called attention of the House of Delegates to the coming dinner in honor of Dr. Edward H. Cary, President of the American Medical Association, on February 20th, and urged all the members to lend their support to insure the success of the meeting. He suggested that each delegate consider himself a committee of one to urge other members of the profession to attend this meeting in honor of the President of the American Medical Association.

Adjourned.

Respectfully submitted,
J. W. LEECH, *Secretary*

R. I. OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY

A regular meeting was held at Peters House, R. I. Hospital, Thursday, Feb. 23rd, at 8:30 P. M., following the R. I. Hospital Staff meeting.

Subject: 1—Presentation Eye Service Cases, Dr. Messinger. 2—Presentation E. N. T. Service Cases, Dr. Porter. 3—Paper of the evening: "Recent Advances in Radiology of the Mastoids," Dr. I. Gerber.

N. A. BOLOTOW, M.D.,
Secretary.

ANNOUNCEMENT

FISKE FUND PRIZE ESSAY
For 1933

The Trustees of the Fiske Fund announced at the annual meeting of the Rhode Island Medical Society, held in June 1932, that they proposed the following subject for the year 1933.

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For the best essay on the subject worthy of a premium they offer the sum of two hundred dollars ($200.00). Every competitor of the premium is expected to conform to the following regulations, namely:

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Previously to receiving the premium awarded, the author of the successful dissertation must transfer to the Trustees all his right, title and interest in and to the same, for the use, benefit and behoof of the Fiske Fund.

Letters accompanying the unsuccessful dissertations will be destroyed unopened, by the Trustees, and the dissertations may be procured by their respective authors if application be made therefor within three months.

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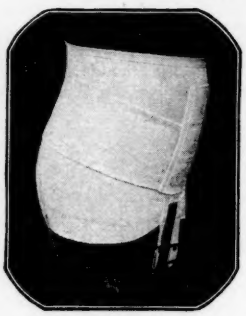

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I'm going to bring him down to your office Wednesday as you suggested. That S.M.A. folder you gave me says even a breast fed baby should be under the supervision of a physician and I think myself that it's better to *keep* the baby well than to wait until trouble starts.

We certainly want to thank you for bringing our baby along so well, Doctor. It increases our confidence in you as our family physician. Tom has already "said it with dollars", but I wanted to thank you personally, too.

And I'm going to persuade Mrs. Brown,—that's my neighbor with the baby that's not gaining—to come along on Wednesday so you can prescribe the proper diet for *him* too.

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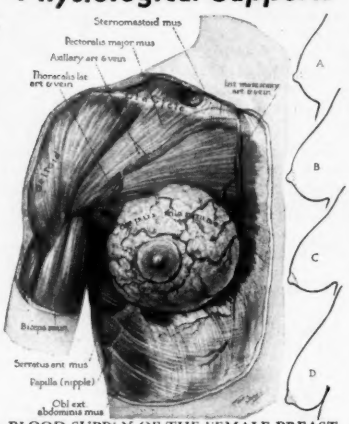

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